of fungi belonging to the same genus as the one we have been considering, or else to the closely allied genus *Pythium*. In illustration of this I will mention one case only.

It is always possible to obtain well-grown specimens of the fungus *Pythium* by sowing cress seed fairly thick, and *keeping the soil well watered and sheltered*. Now what does this mean? Nobody imagines that the fungus arises spontaneously, or is produced in any miraculous manner; and in fact we need not speculate on the matter, for the fact is that by keeping the crowded cress seedlings moist and warm we favour the development of the *Pythium* (spores of which are always there) in somewhat greater proportion than we do the development of the cress. In other words, when the cress is growing normally and happily under proper conditions, it is not because the *Pythium* is absent, but because (under the particular conditions which favour the normal development of healthy cress) it grows and develops spores relatively so slowly that the young cress seedlings have time to grow up out of its reach. The recognition of this struggle for existence on the part of seedlings is of the utmost importance to all who are concerned with the raising of plants.

H. MARSHALL WARD.

NATURAL SELECTION AND ELIMINATION.[1]

MR. DARWIN'S phrase, "natural selection," is applied to such processes, other than those involving the agency of man, as result under Nature in the survival of the fittest. These processes fall under two heads, which have not, I think, been sufficiently distinguished. For the first of these I here retain the word *selection*; for the other I suggest the term *elimination*.

In natural selection the favourable varieties are chosen out for survival: in natural elimination the failures or comparative failures are weeded out. In the one, Nature is employing conscious agents upon the upper or superior end of the scale: in the other, Nature is, through conscious or unconscious agencies, at work on the lower or inferior end of the scale.

Variation is constantly taking place; and the variations may be favourable or unfavourable or neutral. Under selection the favourable variations will be chosen out; the unfavourable and the neutral may go. Under elimination the unfavourable disappear; the favourable *and the neutral* remain. By how much the favourable variations are in excess, by so much will the race tend to advance. I see no reason why neutral variations should be eliminated, except in so far as—in the keen struggle for existence—they become relatively unfavourable.

In the valuable and suggestive paper in which Mr. G. J. Romanes dealt with physiological isolation, he brought forward the inutility of specific characters as one of the three cardinal difficulties in the way of natural selection considered as a theory of the origin of species. So long as we consider selection proper, this objection is valid. But under elimination (by far the more potent of the two) there is no reason why specific features without utilitarian significance should be weeded out. Undoubtedly, in the long run, useful variations will tend more and more to preponderate, since, the longer and keener the struggle, the greater the tendency for neutral variations to become relatively unfavourable. And this conclusion is in harmony with the teachings of biology. For, as Mr. Romanes remarks, "it is not until we advance to the more important distinctions between genera, families, and orders that we begin to find, on any large or general scale, unmistakable evidence of utilitarian meaning."

Natural elimination is intimately associated with the struggle for existence, which may indeed be regarded as the reaction of the organic world called forth by the action of natural elimination. The struggle for existence is the result of a threefold process of elimination (cf. "Origin of Species," chap. iii.). First, elimination by the direct action of surrounding conditions; secondly, elimination by enemies (including parasites); and, thirdly, elimination by competition.

Natural selection (in the narrower sense suggested) is a much rarer process, and one that only comes into play when intelligence, or (since it may be objected that selection is in some cases instinctive) when the mind-element comes definitely upon the scene of life. Perhaps one of the best examples is the selection of flowers and fruits by insects and fruit-eating animals. But even here (at least in the case of flowers) the process of elimination also comes into play: for the visitation of flowers by insects involves cross-fertilization, the advantages of which Mr. Darwin so exquisitely proved. So that we have here the double process at work, the fairest flowers being selected by insects, and those plants which failed to produce such flowers being eliminated as the relatively unfit.

If we turn to the phenomena of what Mr. Darwin termed "sexual selection," we find both selection and elimination brought into play. By the law of battle the weaker and less courageous males are eliminated, so far as the continuation of their kind is concerned. By the individual choice of the females, the finer, bolder, handsomer, and more tuneful wooers are selected.

When we have to consider the evolution of human folk, the principle of elimination is profoundly modified by the principle of selection. Not only are the weaker eliminated by the inexorable pressure of competition, but we select the more fortunate individuals and heap upon them our favours. This enables us also to soften the rigour of the blinder law; to let the full stress of competitive elimination fall upon the worthless, the idle, the profligate, and the vicious; but to lighten its incidence on the deserving but unfortunate.

It is my belief that our views of evolution gain in clearness by the separation of these two processes by which the survival of the fit is brought about. Whether the use of the term "natural elimination" alongside of and in subservience to "natural selection" would be of service to those who are students and teachers of evolution doctrines, I must leave others to judge.

C. LLOYD MORGAN.

THE FAUNA AND FLORA OF THE LESSER ANTILLES.

ALTHOUGH much has been done of late years, both in the United States and in Europe, towards the investigation of the fauna and flora of the smaller West Indian Islands, or Lesser Antilles, as it is better to call them, much remains to be effected before we can be deemed to have an accurate knowledge of the natural products of these islands. And it is most important that steps should be taken to remedy this deficiency without further delay. As the tide of civilization advances—more slowly, perhaps, it is true, over these islands than in many other parts of the world's surface—the special peculiarities which each individual island possesses among its animal and vegetable indigens are fast becoming overwhelmed by the more powerful animals and plants that accompany the inroads of civilized man upon the wilderness of Nature. As in other places, where settlers from Europe arrive, rats and mice eat out the indigenous animals, and exotic weeds starve out the native plants. It is therefore most desirable that, while there is yet time, exact information should be obtained of the flora and fauna of these islands, every one of which seems to exhibit features more or less peculiar to itself.

This subject having been brought before the Committee of Section D at the Manchester meeting of the British Association by Mr. Sclater, a grant of £100 was made for

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[1] Abstract of a Paper read before the Bristol Naturalists' Society.

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the purpose of initiating investigations in this direction. At the instance of the same gentleman, a similar sum was recently obtained out of the Government grant administered by the Royal Society, shortly after which the separate Committees appointed to administer the two grants agreed to combine for the purpose "of reporting on the present state of our knowledge of the zoology and botany of the West India Islands, and of taking steps to investigate ascertained deficiencies in the fauna and flora."

The joint Committee thus formed consists of Prof. Flower, Mr. Carruthers, Mr. Thiselton Dyer, Dr. Günther, Prof. Newton, Mr. Sclater, Dr. Sharpe, Lieut.-Col. Feilden, and Mr. D. Morris. Prof. Flower has been elected Chairman of the Committee; Mr. Thiselton Dyer, Secretary; and Mr. Sclater, Treasurer.

Lieut.-Col. Feilden having accepted a colonial appointment in Barbados will be in future resident at Bridge-Town, where he will act as local Secretary of the Committee, while Dr. H. A. Alford Nicholls, F.L.S., C.M.Z.S., has kindly agreed to assist in the same capacity in Dominica. In order to commence their investigations without delay, the Committee have secured the services of Mr. George A. Ramage, who was lately associated with Mr. Ridley in his expedition to the island of Fernando Noronha, and has since been collecting in Pernambuco. Mr. Ramage arrived in Dominica in March last, and has proceeded to his work with great zeal. In May, after passing five weeks at Laudat, on the right bank of the Roseau River, about 2000 feet above the sea-level, he moved to St. Aroment, an estate belonging to Dr. Nicholls, just above Roseau, which he found to be a better locality for getting his plants dried. At Laudat he met with great difficulty in this matter on account of the extreme wetness of the climate. Writing in May last, Mr. Ramage speaks of having got, besides his plants, "a good lot of insects, lizards, small snakes, and land-molluscs." Besides these, he had also obtained three specimens of *Peripatus*. This is a valuable discovery, as this singular organism was originally discovered in Dominica by Guilding many years ago, and has not been since obtained in the same locality.

After exploring Dominica, Mr. Ramage will probably receive instructions to proceed to the other islands of the Leeward group, some of which are almost entirely unworked as regards their animal and vegetable life. Now that this important investigation has been so fairly started, it is hoped that little difficulty will be experienced in obtaining further assistance from the British Association and the Royal Society. It should, perhaps, be mentioned that complete sets of all the specimens obtained will be placed in the British Museum and Kew Herbarium, the Directors of these two Institutions being themselves both members of the Committee.

SONNET[*]

TO A YOUNG LADY WITH A CONTRALTO VOICE,

On her singing, on a warm summer's afternoon, without accompaniment, save the music of the birds heard through the open windows of the author's rooms overlooking the beautiful garden of New College, Oxford, the old English ditty,
"Deck not with gems that lovely form for me,"
in which occurs the line,
"I must have loved thee hadst thou not been fair."

THE startled, ambushed, nightingales despair
To match those notes, so tender sweet and low,
That poured through lips where Cupid lays his bow
Had made thee loved e'en hadst thou been less fair.
What need hast thou with gems to deck thy hair,
Of aught of wealth Golconda's mines bestow,
Rubies or pearls rash divers seek below!—
Thou canst in nobler wise thy worth declare.
Oft shall thy votary in his cloistered cell
In deep research of Nature's secret clue
Pause, to bid Memory with her magic spell,
Bring back thy face and sweet girl-form to view,
And in fond fancy hear thy voice anew
Till life to gladness breathes its last farewell.

Athenæum Club, July 25. J. J. S.

NOTES.

NEXT year there will be in Paris what promises to be a splendid Anthropological Exhibition under the auspices of the French Ministry of Public Instruction. It will be organized by Committees representing the Society, the School, and the Laboratory of Anthropology; and an appeal for aid has been addressed to all who are, or have at any time been, connected with one or other of these institutions. The Exhibition will include objects relating to all branches of anthropological science.

CAPTAIN JOHN ERICSSON, who retains much of his vigour and youthful activity, celebrated his eighty-fifth birthday at New York on Tuesday, July 31. The King of Sweden and Norway cabled

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[*] This is the original form of the sonnet, published in the preceding number of NATURE, which, if perhaps superior to this in expression, is open to the reproach from which the original is free, pointed out to the author by his distinguished friend, the great Traveller and Orientalist (the translator, too, of Camoens sonnets), Sir Richard Burton, of deviating from the Petrarchian model by its sestett having one rhyme in common with the octave. In my "Laws of Verse" (if I remember right) I have compared the octave and sestett of a sonnet to the body and the frame or bed of a carriage respectively. The effect of a rhyme common to the two may be likened to that of driving in a spike, which converts the previous springy connection of the two parts into a fixture. The much more common fault of English sonnets is the reverse of this, viz. that they contain too many distinct rhymes instead of too few. In the form-build of the two sonnets I may be said to have discovered a locket artistically adapted to receive either one of two miniatures, each in its own way equally exquisite, and worthy of ineffable regard and adoration. I left the Subject of this week's sonnet at the door of Magdalen College Chapel to attend the evening service there, and early the next morning, as it now reads, with the exception of changes in three lines only, it was in the hands of her parents.

With regard to the punctuation of this and other of my poetical pieces, I share to a great extent the opinion of the late deeply regretted Matthew Arnold, that in poetical composition the fewer points the better: grammatical or (so to say) choristic points as such should never be introduced except when necessary to prevent ambiguity or obscurity of meaning: consequently there will be many points left out in poetry which would be found in the same piece written in prose. But *per contra* I hold that points are sometimes useful or even necessary in poetry which would not be found in prose, viz. to mark brief pauses or almost insensible musical rests. The pointing I have adopted in the line from last week's sonnet—

Thy flashing, rushing, fingers to indue—

affords an exemplification of this latter principle. The commas on each side of *rushing* are not choristic but melodic, and would not appear in prose.

In law writings no points at all are introduced, and for reasons which in no wise conflict with the principles referred to above.

1°. A law document is expected and ought to be written in such a form as to be insusceptible of an equivocal or doubtful construction.

2°. No one expects a law document (unless maybe it were a marriage certificate or deed of separation by mutual consent) to have much music in its lines.

One of the official readers of the sonnet contained in the last number of NATURE has written to me to say that he cannot see the sense of lines 3 and 4. The answer is, I think, obvious. In the human organism all parts, faculties, and powers are connected and correlated. Consequently a voice whose notes are pure, sweet, and true affords a voucher (I do not say mathematical proof, but presumptive evidence which may be accepted in the absence of rebutting facts) of the character to which it appertains being sweet, pure, and true. But sweetness, purity, and truth are the prime ingredients of goodness. Therefore notes which are pure, sweet, and true vouch for the goodness of the person to whom the voice belongs. Q.E.D.

The argument in the text is put in the form of an enthymeme, the major premise—*All persons whose singing notes are sweet, pure, and true offer a presumption that they are good*—being suppressed. It is notorious that birds instinctively, and therefore on the surest ground, infer the worthiness (or according to their ethical code the goodness) of their partners from their superiority in song. Witness the distich from a sonnet familiar to many of my readers—

Like foolish bird who in the fowler's cry
Hears her loved mate's soft amorous melody

If I am wrong in supposing so, I hope that Mr. Romanes, or any other biologist (if such there be) of equal skill with him in Darwinian dialectics, will set me right in this point, and inform the readers of NATURE on what other intelligible ground can be explained the recourse had to song by the male bird to win the affections of his mate. If such be the case with birds, why should it not be equally true of the sometimes scarcely less volatile portion of the human race?

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